



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/813,467	03/29/2004	Bill J. Peck	10031551-1	4799

22878 7590 06/23/2006

AGILENT TECHNOLOGIES, INC.
INTELLECTUAL PROPERTY ADMINISTRATION, LEGAL DEPT.
M/S DU404
P.O. BOX 7599
LOVELAND, CO 80537-0599

EXAMINER

CROW, ROBERT THOMAS

ART UNIT

PAPER NUMBER

1634

DATE MAILED: 06/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/813,467	Applicant(s) PECK ET AL.	
	Examiner Robert T. Crow	Art Unit 1634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 May 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 28-60 is/are pending in the application.
- 4a) Of the above claim(s) 60 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 28-59 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>3</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

Applicant's election of Group I in the reply filed on 26 May 2006 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claim 60 is withdrawn. Claims 1-27 were previously cancelled. Claims 28-59 are under prosecution.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 28-55 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

1. Claims 28-55 are indefinite in the recitation "contacting a substrate comprising an attached blocked nucleoside monomer or polymer" in line 3 of claim 28. It is unclear whether "attached" modifies only the nucleoside monomer or if modifies the polymer as well. It is also unclear if "blocked" modifies only the nucleoside monomer or if

Art Unit: 1634

modifies the polymer as well. It is suggested the claim be amended to clarify the relationship, if any, between the substrate and the polymer. Claims 28-55 are also indefinite in claim 28, which recite the limitation "the substrate surface" in line 6 of claim 28. There is insufficient antecedent basis for this limitation in the "substrate" in lines 1 and 2 of claim 28. It is suggested the claim be amended to reflect proper antecedent basis.

2. Claims 28-59 are indefinite in claims 28 and 56, which recite the limitation "the blocking group" in line 4 of claim 28 and in line 9 of claim 56. There is insufficient antecedent basis for this limitation of the claim in the "blocked nucleoside monomer" of line 3 of claim 28 or in the "blocked nucleoside monomers" in line 3 of claim 56. It is suggested the claims be amended to reflect proper antecedent basis.

3. Claim 35 is indefinite in the recitation "the blocking fluid" at the end of the claim. There is insufficient antecedent basis for "the blocking fluid" in "a deblocking fluid" of claim 28. It is suggested the claim be amended to reflect proper antecedent basis.

4. Claims 36 and 54 are indefinite in the recitation "at least about" in the last line of claim 36 and in line 2 of claim 54. The phrase "at least" typically indicates a minimum point; however, the phrase "at least" is controverted by the term "about," which implies that values above and below the indicated amount are permitted. Therefore, the

Art Unit: 1634

juxtaposition of these two terms makes it unclear what minimum purity is encompassed by the claim. In *Amgen, Inc. v. Chugai Pharmaceutical co.*, 927 F.2d 1200 (CAFC 1991), the CAFC stated, “[t]he district court held claims 4 and 6 of the patent invalid because their specific activity of “at least about 160,000” was indefinite.” After review, the CAFC states “[w]e therefore affirm the district court's determination on this issue.” Thus, the CAFC found the phrase “at least about” indefinite where the metes and bounds of the term were not defined in the Specification.

5. Claim 36 is indefinite in the recitation “a density difference of at least about 0.01” at the end of the claim, because the quantity has no units. It is suggested that the claim be amended to include the units of density.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 28-34, 39-43, 46-48, 50-51, and 54-59 are rejected under 35 U.S.C. 102(b) as being anticipated by Gao et al (U.S. Patent No. 6,426,184 B1, issued 30 June 2002).

Regarding claim 28, Gao et al teach the method for synthesizing an oligonucleotide on a substrate, comprising: contacting a substrate comprising an attached blocked nucleoside monomer of polymer with a deblocking fluid to remove the blocking group, thereby generating an unblocked attached nucleoside monomer or polymer (e.g., 5'-O-DMT protected nucleosides attached to controlled pore glass are treated with a CH_2Cl_2 solution containing mixed triarylsulfonium hexafluoro-antimonate and irradiated, thereby photogenerating an acid that cleaves the DMT group, thereby unblocking the attached nucleoside; column 31, Example II).

Gao et al also teach displacing the blocking fluid from the substrate surface comprising the attached unblocked nucleoside monomer or polymer with a purging fluid (e.g., the controlled pore glass is treated with multiple different solutions [e.g., a CH_2Cl_2 and a CH_3CN wash [column 31, Example II and Table 2]; any of the various solvents or steps used in the series of steps following the deblocking step that are outlined in Table 2 are collectively interpreted as the purging fluid of the instant claims). Gao et al also teach reacting the attached unblocked nucleoside monomer or polymer with another blocked nucleoside monomer (e.g., oligonucleotides are synthesized by the method; column 32, Example IV).

Regarding claim 29, Gao et al teach the method of claim 28, wherein a blocked nucleoside monomer is attached to the substrate by contacting the substrate with a fluid comprising a blocked nucleoside monomer at a location on the substrate that comprises hydroxyl groups (column 18, line 45-column 19, lines 11 and Figure 1).

Regarding claim 30, Gao et al teach the method of claim 28, wherein the step of the method are repeated a plurality of times (column 32, Example IV and Table 2).

Regarding claim 31, Gao et al teach the method of claim 28, wherein the substrate comprises a planar support (column 18, lines 37-44).

Regarding claim 32, Gao et al teach the method of claim 28, wherein the displacing step causes minimal mixing of deblocking and purging fluids (e.g., the substrate is washed before being supplied with the next monomer; column 32, Example IV and Table 2).

Regarding claim 33, Gao et al teach the method of claim 28, wherein the substrate comprises a surface of a support containable within a flow cell (e.g., the substrate is part of a reaction cell [column 27, lines 15-25 and Figures 9A-C], and the reaction cell [i.e., reactor assembly] is part of a synthesis apparatus having a reagent manifold for solvent transport and purging; column 24, lines 35-55).

Regarding claim 34, Gao et al teach the method of claim 28, wherein the substrate comprises a surface of a planar support (column 18, lines 37-44).

Regarding claim 39, Gao et al teach the method of claim 28, wherein the purging fluid is an organic fluid (e.g., the purging fluid [i.e., washing fluid] is acetonitrile; Table 2).

Regarding claim 40, Gao et al teach the method of claim 28, wherein the purging fluid comprises an oxidant (e.g., the purging fluid as described above comprises an oxidation solution; step 13 of Table 2).

Regarding claim 41, Gao et al teach the method of claim 28, wherein the purging fluid comprises a wash fluid (e.g., the purging fluid as described above comprises a wash solution; step 2a of Table 2).

Regarding claims 42-43, Gao et al teach the method of claim 41, wherein the wash fluid is an organic fluid (e.g., acetonitrile; step 2a of Table 2).

Regarding claim 46, Gao et al teach the method of claim 28, wherein the purging fluid limits the efficiency of deblocking by the deblocking fluid (e.g., the purging fluid includes the solution of step 13 of Table 2, which contains I₂, THF, pyridine, and water; this combination is indicated on pp. 34-35 of the Specification as meeting the limitations of the claim).

Regarding claim 47, Gao et al teach the method of claim 29, wherein the hydroxyl functional groups are provided by 5'- groups of nucleoside monomers or polymers attached to the substrate (e.g., Figure 2).

Regarding claim 48, Gao et al teach the method of claim 28, wherein the step of displacing occurs in a flow cell (e.g., the substrate is part of a reaction cell [column 27, lines 15-25 and Figures 9A-C], and the reaction cell [i.e., reactor assembly] is part of a synthesis apparatus having a reagent manifold for solvent transport and purging; column 24, lines 35-55).

Regarding claim 50, Gao et al teach the method of claim 28, wherein the blocking group comprises an acid labile blocking group and wherein the deblocking fluid comprises an acid (e.g., e.g., the blocking group is a 5'-O-DMT group, which is treated

with a CH_2Cl_2 solution containing mixed triarylsulfonium hexafluoro-antimonate and irradiated, thereby photogenerating an acid that cleaves the DMT group, thereby unblocking the attached nucleoside; column 31, Example II).

Regarding claim 51, Gao et al teach the method of claim 33, wherein the substrate is contained with a chamber of a flow cell when contacted with deblocking fluid (e.g., the substrate is part of a reaction cell [column 27, lines 15-25 and Figures 9A-C], and the reaction cell [i.e., reactor assembly] is part of a synthesis apparatus having a reagent manifold for solvent transport and purging; column 24, lines 35-55) and wherein the chamber comprises at least one fluid inlet and at least one fluid outlet (column 28, lines 60-62 and Figure 10).

Regarding claim 54, Gao et al teach the method of claim 28 as discussed above. Gao et al also teach the deblocking fluid is toluene (column 3, lines 23-34), which is defined on page 31 of the Specification as meeting the limitations of the claim.

Regarding claim 55, Gao et al teach the method of claim 28, further comprising contacting the substrate comprising the attached blocked nucleoside monomer of polymer with an oxidation fluid prior to contacting with the deblocking fluid (e.g., Table 2, wherein oxidation step 13 takes place before deblocking in the next round of synthesis).

Regarding claim 56, Gao et al teach a method of producing a substrate of at least two oligonucleotides bonded to different locations on a surface of the substrate, comprising: contacting blocked nucleoside monomers to at least a first location and a

Art Unit: 1634

second different location of a substrate surface displaying functional groups under conditions sufficient for the blocked nucleoside monomers to bond the surface in first and second locations to produce a substrate surface displaying bonded monomers (e.g., column 36, Example VIII and Figure 19); contacting the surface displaying bound blocked monomers with a deblocking fluid to remove the blocking group, thereby generating unblocked nucleoside monomers at the first and second locations (column 36, Example VIII); displacing the blocking fluid from the surface comprising the bound unblocked monomers at the first and second locations with a purging fluid (e.g., the surface was washed; column 36, lines 38-39); reacting the attached unblocked nucleoside monomers at the first and second location with another blocked nucleoside monomer (e.g., a second coupling step is performed; column 36, lines 40-44).

Regarding claim 57, Gao et al teach the method of claim 56 wherein the at least two oligonucleotides comprise the same sequence composition (e.g., the last array shown in Figure 1, where there are three copies of TAGC shown at different locations, wherein the location is defined as the point of attachment of each distinct linker molecule to surface).

Regarding claim 58, Gao et al teach the method of claim 56 wherein the at least two oligonucleotides comprise different sequence compositions (e.g., the last array of Figure 1, wherein a plurality of different sequences are shown on the array).

Regarding claim 59, Gao et al teach the method of claim 56, further comprising contacting the bonded blocked monomers with an oxidation fluid prior to contacting

with the deblocking fluid (e.g., Example VII refers to the steps of Table 2, wherein oxidation step 13 takes place before deblocking in the next round of synthesis, and a plurality of different sequences are synthesized on the array Figure 1).

2. Claims 28, and 35-38 are rejected under 35 U.S.C. 102(b) as being anticipated by Gao et al (U.S. Patent No. 6,426,184 B1, issued 30 June 2002) as defined by the Merck Index (12th edition, Whitehouse Station NJ, pp. 11, 802, 1035, and 1574, (1996)).

Regarding claim 35, Gao et al teach the method of claim 28 as discussed above. Gao et al also teach the method wherein the purging fluid has a density that is different from the blocking fluid (e.g., Table 2, wherein the blocking fluid [i.e., the capping fluid; Table 2] is a mixture of acetic anhydride and THF, which have respective densities of 1.08 and .8892 as defined by the Merck Index, and the purging fluid [i.e., washing fluid; Table 2] is acetonitrile, which has a density of .7138 as defined by the Merck Index).

Regarding claim 36, Gao et al teach the method of claim 28, wherein the purging fluid and the deblocking fluid have a density that is difference of about 0.01 (e.g., the purging fluid [i.e., washing fluid; Table 2] is acetonitrile, which has a density of .7138 as defined by the Merck Index, and the deblocking fluid is CH₂Cl₂ [Table 2], which has a density of 1.32 as defined by the Merck Index).

Regarding claim 37, Gao et al teach the method of claim 28, wherein the purging fluid has a density that is higher than the deblocking fluid (e.g., the purging fluid [i.e., washing fluid; Table 2] is acetonitrile, which has a density of .7138 as defined by the

Art Unit: 1634

Merck Index, and the deblocking fluid is hexane [column 3, lines 23-34], which has a density of 0.66 as defined by the Merck Index).

Regarding claim 38, Gao et al teach the method of claim 28, wherein the purging fluid has a density that is lower than the deblocking fluid (e.g., the purging fluid [i.e., washing fluid; Table 2] is acetonitrile, having a density of .7138 as defined by the Merck Index, and the deblocking fluid is CH₂Cl₂ [Table 2], which has a density of 1.32 as defined by the Merck Index).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

Art Unit: 1634

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

2. Claims 28 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gao et al (U.S. Patent No. 6,426,184 B1, issued 30 June 2002) in view of Nagatomo et al (U.S. Patent No. 4,282,825, issued 11 August 1981).

Regarding claim 44, Gao et al teach the method for synthesizing an oligonucleotide on a substrate of claim 28, comprising: contacting a substrate comprising an attached blocked nucleoside monomer of polymer with a deblocking fluid to remove the blocking group, thereby generating an unblocked attached nucleoside monomer or polymer (e.g., 5'-O-DMT protected nucleosides attached to controlled pore glass are treated with a CH₂Cl₂ solution containing mixed triarylsulfonium hexafluoro-antimonate and irradiated, thereby photogenerating an acid that cleaves the DMT group, thereby unblocking the attached nucleoside; column 31, Example II).

Gao et al also teach displacing the blocking fluid from the substrate surface comprising the attached unblocked nucleoside monomer or polymer with a purging fluid (e.g., the controlled pore glass is treated with multiple different solutions [e.g., a CH₂Cl₂ and a CH₃CN wash [column 31, Example II and Table2]; any of the various solvents or steps used in the series of steps following the deblocking step that are outlined in Table 2 are collectively interpreted as the purging fluid of the instant

Art Unit: 1634

claims). Gao et al also teach reacting the attached unblocked nucleoside monomer or polymer with another blocked nucleoside monomer (e.g., oligonucleotides are synthesized by the method; column 32, Example IV). Gao et al do not teach a stratified fluid interface.

However, Nagatomo et al teach a method of treating a surface comprising treatment of substrates (i.e., wafers) with surface treating liquids (Abstract) using a stratified fluid interface (i.e., stream) with the added advantage that the concentration and temperature distribution of the fluid are normalized so that surface treatment is uniform and reliable (column 11, lines 1-6).

It would therefore have been obvious to a person of ordinary skill in the art at the time the invention was claimed to have modified the method of Gao et al with the stratified fluid as taught by Nagatomo et al with a reasonable expectation of success. The ordinary artisan would have been motivated to make such a modification because said modification would have resulted in normalization of concentration and temperature distribution so that surface treatment is uniform and reliable as explicitly taught by Nagatomo et al (column 11, lines 1-6).

3. Claim 45 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gao et al (U.S. Patent No. 6,426,184 B1, issued 30 June 2002) and Nagatomo et al (U.S. Patent No. 4,282,825, issued 11 August 1981) as applied to claim 44 above, and further in view of Nonomura et al (U.S. Patent No. 6,139,708, published 31 October 2000).

Regarding claim 45, the method of claim 44 is discussed above. While Nagatomo et al teach flow rates (column 8, lines 65-67), neither Gao et al nor Nagatomo et al teach flow rates from about 1 to about 20 cm/s.

However, Nomomura et al teach a method of treating a surface with a liquid material (Abstract) utilizing flow rates of about from about 1 to about 20 cm/s (e.g., within 10-25 cm/s) with the added benefit that the rate is fast enough to prevent precipitation on the work (i.e., the surface; column 7, lines 35-39).

It would therefore have been obvious to a person of ordinary skill in the art at the time the invention was claimed to have modified the method of Gao et al and Nagatomo et al with the flow rates as taught by Nonomura et al with a reasonable expectation of success. The ordinary artisan would have been motivated to make such a modification because said modification would have resulted in a rate that is fast enough to prevent precipitation on the surface as explicitly taught by Nonomura et al (column 7, lines 35-39).

4. Claims 28, 33, 51, and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gao et al (U.S. Patent No. 6,426,184 B1, issued 30 June 2002) in view of Fodor et al (U.S. Patent Application Publication No. US 2002/0137096 A1, published 26 September 2002).

Regarding claim 52, the method of claim 28 is discussed above. Gao et al also teach the method of claim 33, wherein the substrate comprises a surface of a support

Art Unit: 1634

containable within a flow cell (e.g., the substrate is part of a reaction cell [column 27, lines 15-25 and Figures 9A-C], and the reaction cell [i.e., reactor assembly] is part of a synthesis apparatus having a reagent manifold for solvent transport and purging; column 24, lines 35-55). Gao et al also teach the method of claim 51, wherein the substrate is contained within a chamber of a flow cell when contacted with deblocking fluid (e.g., the substrate is part of a reaction cell [column 27, lines 15-25 and Figures 9A-C], and the reaction cell [i.e., reactor assembly] is part of a synthesis apparatus having a reagent manifold for solvent transport and purging; column 24, lines 35-55) and wherein the chamber comprises at least one fluid inlet and at least one fluid outlet (column 28, lines 60-62 and Figure 10). Gao et al are silent with respect to vertical flow cells.

However, Fodor et al teach a method for the synthesizing oligonucleotides on an array comprising a vertical flow cell with the added benefit that the vertical positioning ensures total coverage of the substrate with the solutions (paragraph 0312).

It would therefore have been obvious to a person of ordinary skill in the art at the time the invention was claimed to have modified the method of Gao et al with vertical positioning as taught by Fodor et al with a reasonable expectation of success. The ordinary artisan would have been motivated to make such a modification because said modification would have resulted in ensuring total coverage of the substrate with the solutions as explicitly taught by Fodor et al (paragraph 0312).

5. Claim 53 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gao et al (U.S. Patent No. 6,426,184 B1, issued 30 June 2002) and Nagatomo et al (U.S. Patent No. 4,282,825, issued 11 August 1981) as applied to claim 44 above, and further in view of Farr (U.S. Patent No. 3,969,250, issued 13 July 1976).

Regarding claim 53, the method of claim 44 is discussed above. Neither Gao et al nor Nagatomo et al teach a pressure gradient.

However, Farr teaches stratification of liquids using a pressure gradient (e.g., creation of supernatant fluid by centrifuging immiscible liquids; column 1, lines 5-10) with the added advantage that the stratification (i.e., the creation of a supernatant) eliminates the need for decanting, thereby minimizing labor and possible contamination of the sample (column 2, lines 24-26).

It would therefore have been obvious to a person of ordinary skill in the art at the time the invention was claimed to have modified the method of Gao et al and Nagatomo et al with the stratification using a pressure gradient as taught by Farr with a reasonable expectation of success. The ordinary artisan would have been motivated to make such a modification because said modification would have resulted in minimizing labor and possible contamination of the sample as explicitly taught by Farr (column 2, lines 24-26).

6. Claims 28-29 and 49 rejected under 35 U.S.C. 103(a) as being unpatentable over Gao et al (U.S. Patent No. 6,426,184 B1, issued 30 June 2002) in view of Gamble et al (U.S. Patent No. 5,874,554, issued 23 February 1999).

Regarding claim 49, the method of claim 28 is discussed above. Gao et al also teach the method of claim 29, wherein a blocked nucleoside monomer is attached to the substrate by contacting the substrate with a fluid comprising a blocked nucleoside monomer at a location on the substrate that comprises hydroxyl groups (column 18, line 45-column 19, lines 11 and Figure 1). While Gao et al also teach inkjet printing in the synthesis of DNA oligomers (column 28, lines 21-25), Gao et al do not teach pulse jetting of monomers.

However, Gamble et al teach a method of synthesizing oligonucleotides by pulse jetting monomers (Abstract, line 1) with the added benefit that pulse jetting reduces reagent waste (column 1, lines 50-55).

It would therefore have been obvious to a person of ordinary skill in the art at the time the invention was claimed to have modified the method as taught by Gao et al with the pulse jetting of monomers as taught by Gamble et al with a reasonable expectation of success. The ordinary artisan would have been motivated to make such a modification because said modification would have resulted in reducing reagent waste as explicitly taught by Gamble et al (column 1, lines 50-55).

Statutory Double Patenting

A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

Claims 28-59 are provisionally rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 1-3 and 7-36 of copending Application No. 11/234,701. This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.

Nonstatutory Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

1. Claims 28, 30, 32-34, 39-43, 48-49, 51, 54, 55, and 56-59 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 3-8, and 10-18 of copending Application No. 11/082,006 in view of Wilding et al (U.S. Patent No. 5,498,392, issued 12 March 1996). Both sets of claims are drawn to deblocking reagents, purging fluids (i.e., the washing step of the '006 claims), flow cells, nucleoside monomers, pulsejets, oxidizing agents, and reiterating steps. The instant claims are silent with respect to multiple chambers.

However, Wilding et al teach a method using a flow cell (i.e., a mesoscale polynucleotide device; Abstract) having a plurality of chambers with the added advantage that the plurality of chambers can each be maintained at a temperature suitable for conducting a particular reaction (column 10, lines 5-10).

It would therefore have been obvious to a person of ordinary skill in the art at the time the invention was claimed to have modified the method of the instant claims with the multiple chambers of Wilding et al with a reasonable expectation of success. The ordinary artisan would have been motivated to make such a modification because said modification would have resulted in the a plurality of chambers that can each be maintained at a temperature suitable for conducting a particular reaction as explicitly taught by Wilding et al (column 10, lines 5-10).

This is a provisional obviousness-type double patenting rejection.

2. Claims 56-59 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-4, and 12-14 of copending Application No. 10/813,337. Both sets of claims are drawn to contacting blocked monomers at least two locations, removing blocked groups, reiterating steps, oxidizing fluids, a plurality of fluids, flow cells, and pulse jets. While the instant claims only teach two liquids, the open language "comprising" in the instant claims encompasses the additional limitations.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

3. Claims 28, 30, 32-33, 35-36, and 38-48 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-4, and 7-16 of copending Application No. 10/813,331. Both sets of claims are drawn to nucleoside monomers, deblocking, density differences, flow cells, flow rates, and pulse jets. While the instant claims only teach two liquids, the open language "comprising" in the instant claims encompasses the additional limitations.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

4. Claims 28-59 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 and 4-5 of

copending Application No. 10/449,838. Both sets of claims are drawn to contacting a ligand array with a feature modification reagent (e.g., contacting the monomer array of the instant claims with a fluid that changes the surface [i.e., by oxidizing the monomers])). While the instant claims do not teach high surface tension deposition fluids, the open language "comprising" in the instant claims encompasses the additional limitations.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.



Conclusion

1. No claim is allowed.
2. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert T. Crow whose telephone number is (571) 272-1113. The examiner can normally be reached on Monday through Friday from 8:00 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ram Shukla can be reached on (571) 272-0735. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Robert T. Crow
Examiner
Art Unit 1634


6/21/06

**BJ FORMAN, PH.D.
PRIMARY EXAMINER**